

REMARKS

The above amendments and following remarks are responsive to the non-final Office Action mailed March 24, 2004. Upon entry of the above amendments, Claims 1-4, 6, and 7 will have been amended and Claims 1-7 will be pending. No new matter has been introduced. Entry and reconsideration are respectfully requested.

Response to the Objection of the Claims

Claims 1-7 have been objected to on the basis of various identified informalities. Applicant has amended Claims 1-4, 6, and 7 to overcome the Examiner's objection.

Contrary to the Examiner's comments, Claim 7 recites a stereoscopic observation system comprising a satellite and a stereoscopic image acquisition means. The stereoscopic image acquisition means being the device recited in any preceding claim, i.e., any of Claims 1-6. The use of an optical system with a satellite is well known and well within the ambit of one of ordinary skill in the art. As such, Applicant respectfully submit that the subject matter of Claim 7 is not incomplete and would be clearly understood by one of ordinary skill in the art to which the application and claims are appropriately directed.

Accordingly, the objection of Claims 1-7 is now moot and should be withdrawn.

Response to Rejection under 35 U.S.C. § 103(a)

Claims 1, 2, and 4-7 have been rejected under 35 U.S.C. § 103(a) as being obvious over US Patent 4,101,195 to Frosch et al. (Frosch). Claims 3 and 7 have been rejected under 35 U.S.C. § 103(a) as being obvious over Frosch as applied to Claim 1 above, and further in view of German Patent Publication DE 43 07 831 A1. Applicant traverses these rejections.

In the March 24, 2004 non-final Office Action, the Examiner admits that Frosch does not teach each feature of the invention in that Frosch does not explicitly teach that “the image acquisition means is to acquire stereoscopic images”, and “the mirror is a [sic] parabolic.” The Examiner urges:

“However as clearly demonstrated in Figure 2, there are two image light beams following different light paths and two images are generated and formed at the image plane from the observation device, which suggests that the two images formed could be stereoscopically related to provide stereoscopic images... The two different optical paths followed by the two image lights could provide the difference in perspective. Furthermore, it has been held that a recitation with respect to the manner in which a claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. Ex parte Madham [sic], 2 USPQ2d 1647 (1987).”

From there, the Examiner concludes:

“However it is well known in the art for the Cassigrain design (i.e., with the primary and secondary mirror arrangement taught by Frosch et al), to use [a] parabolic mirror as [an] alternative mirror means for the primary mirror, since the idea is to use a mirror with definite focal points to place the secondary mirror at the focal points, therefore collects collimated light to focus on the secondary mirror. Such modification would therefore have been obvious matters of design choice to one of ordinary skill in the art for the benefit of using a different mirror design to achieve the same function, namely forming images on the image plane.”

Applicant respectfully submits that Frosch does not teach, suggest, renders obvious, or has otherwise “clearly demonstrated”, as suggested by the Examiner, that the anastigmatic three-mirror telescope disclosed by Frosch provides two image light beams following different light paths, wherein two images are generated and formed at the image plane from the telescope and are stereoscopically related to provide stereoscopic images of different perspective. In addition, Applicant respectfully takes reservation with the Examiner’s comments regarding “obvious matters of design choice to one of ordinary skill in the art for the benefit of using a different mirror design to achieve the same function, namely forming images on the image plane.” The

Examiner has not provided any specific prior art teaching, including the disclosure of Frosch, that teaches or suggests that a parabolic primary mirror is, in fact, a well known alternative for the elliptical primary mirror 10 of Frosch. No where, within the metes and bounds of the Frosch disclosure, is it seen where Frosch teaches or suggests, that primary mirror 10 is anything other than an ellipsoid or of an ellipsoidal configuration. Likewise, the Examiner has not shown any reasonable expectation that the proposed modification of Frosch would be successful. That is, the Examiner has not shown that the anastigmatic three-mirror telescope of Frosch as modified by the Examiner, will overcome the deficiencies of the prior art and perform as disclosed by Frosch.

Notwithstanding the shortfalls of Frosch, as admitted by the Examiner, Applicant, nonetheless, has amended independent Claim 1 to recite an observation device for receiving, at two different moments, light beams of an object to observe along two respective angles of incidence θ_1 and $-\theta_1$ utilizing a primary mirror, secondary reflection means, a tertiary reflection means, and image acquisition means characterized in that:

“the secondary reflection means comprises a mirror situated on the optical axis of the primary mirror, and in that the primary mirror and secondary reflection means are dimensioned in such a manner that the beams which are incident on said primary mirror with respective angles θ_1 and $-\theta_1$ are focused respectively on the tertiary reflection means which comprises means for focusing incident light beams onto the image acquisition means.”

Applicant respectfully submits that Frosch, in addition to the items identified by the Examiner, neither teaches nor suggests an observation device as recited in Claim 1, in particular, an observation device having an optical system arranged to observe an object along two respective angles of incidence θ_1 and $-\theta_1$.

Frosch, in regarding the anastigmatic three-mirror telescope, as illustrated in Figures 1 and 2, discloses, from Column 2, Line 57 through Column 3, Line 53, that:

“Referring to FIG. 1, primary mirror 10, having a central opening 11, is positioned at end 12 of tube or tubular housing 14 and is an ellipsoid. Secondary mirror 16, which is supported in tube 14 by conventional spider support members 18, is a hyperbolic mirror. Tertiary mirror 20, supported by auxiliary support housing 22 (by means not shown), is an ellipsoid. Plane mirror 24, which is supported on spider members 26 at an angle of 45.degree. with respect to the axis 28 of telescope 30, is made small to permit light to pass around it from secondary mirror 16 to tertiary mirror 20 and yet effectively receive light from tertiary mirror 20 and reflect it upward to image plane 32 of camera 34. Instead of a camera, an eyepiece could be positioned, for viewing through the telescope, at image plane 32.

Thus, in operation, rays 36 enter end 38 of tube 14 and pass around secondary mirror 16 and impinge on primary mirror 10 which reflects the rays onto secondary mirror 16. Rays 36 are then reflected by secondary mirror 16 onto tertiary mirror 20. Tertiary mirror 20 reflects the rays onto plane mirror 24, and this mirror reflects the rays upward to focal plane 32 where they are observed and recorded by camera 34, or otherwise viewed. The rays in FIG. 1 show the outside limits of the envelope of light throughout the telescope.

In the alternate configuration shown in FIG. 2, a larger plane or fold mirror 40 directly receives rays 36 from secondary mirror 16 and reflects them to tertiary mirror 20. Rays 36 from tertiary mirror 20 are then reflected through an opening 42 in plane mirror 40 to final image plane 32. This configuration minimizes obscuration by avoiding the use of a spider 26, as shown in FIG. 1, that holds a small fold mirror 24, and at the same time significantly improves the baffling of the system. In fact, an additional advantage of this three-mirror configuration over the Cassegrain two-mirror configuration is its natural baffling property. In contrast, in the Cassegrain telescope, in order to protect the secondary image from stray light, fairly complex and elaborate baffling systems are required. Thus, in the present invention, the final image plane is inherently protected from stray light by the folded-out image plane and the location of exit pupil 42 being behind the tertiary mirror, which together form a bottleneck in the optical train. More particularly, with respect to the embodiment of the invention shown in FIG. 1, the only stray light that can reach the final image plane is that scattered off spider members 26 holding small fold mirror 24. However, the spider members are so far within the optical system that they will not be illuminated by the moon, earth or sun.

An even more efficient baffling effect is achieved with the configuration shown in FIG. 2. With this configuration, no stray light can reach an image plane

after only a single scattering event. Even the light that is scattered off the edges around perforation 42 of fold mirror 40, and then reflected by the tertiary through exit pupil 42, will be intercepted by the central vignetted portion 44 rather than by the useful field. A further advantage is the accessibility of the image of the spider holding the secondary mirror as formed by the tertiary mirror. It is located immediately behind exit pupil 42 and can, at least in the configuration of the invention shown in FIG. 2, easily be masked off, e.g., by a screen shape like the image of the spider.”

No where within the above words of Frosch is it seen where Frosch teaches or suggests that the an anastigmatic three-mirror telescope disclosed therein includes a parabolic primary mirror and a secondary refelection means comprising a mirror situated on the optical axis of the primary mirror, and in that the primary mirror and secondary reflection means are dimensioned in such a manner that the beams which are incident on said primary mirror with respective angles θ_1 and $-\theta_1$ are focused respectively on the tertiary reflection means which comprises means for focusing incident light beams onto the image acquisition means.

The Examiner’s reliance on the decision reached by the Board of Patent Appeals and Interferences in *Ex parte Masham*, supra, is without foundation. Section 2114 of the Manual of Patent Examining Procedure, under the subtitle “MANNER OF OPERATING THE DEVICE DOES NOT DIFFERENTIATE APPARATUS CLAIM FROM PRIOR ART”, states that:

“A claim containing a ‘recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus’ **if the prior art apparatus teaches all of the structural limitations of the claim.** *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987)...” (bolding added for emphasis).

As admitted by the Examiner, the applied prior art reference of Frosch **fails to teach all of the structural limitations of independent Claim 1**. As such, the issues surrounding the decision of Board of Patent Appeals and Interferences in *Ex parte Masham* are not applicable to the present situation.

In view of the above, the observation device recited in Claim 1 is distinguished over the applied prior art reference of Frosch. Claims 2, 4-6, and 7, which depend from Claim 1, are likewise distinguished over Frosch for at least the same reasons as Claim 1. Further, Claims 3 and 7, although not rejected over Frosch alone, also depend from Claim 1 and are therefore, distinguished over Frosch for at least the same reasons as Claim 1. Accordingly, the rejection under 35 U.S.C. § 103(a) over Frosch should be withdrawn.

The Examiner also admits that Frosch does not teach each feature of the invention as recited in dependent Claims 3. With respect to Claim 3, the Examiner admits that the tertiary mirror means of Frosch does not include two plane mirrors and two curved mirrors. To remedy the further admitted deficiency of Frosch, the Examiner relies on the secondary prior art teaching of the German Patent Publication DE 43 07 831 A1 (the German Publication). The Examiner urges that it would have been obvious to one of ordinary skill in the art to further modify Frosch by utilizing the two sets of mirrors, as taught by the German Publication, as alternative means to achieve image acquisition.

Contrary to the Examiner's position, nowhere is it seen within the disclosure of Frosch where Frosch teaches or suggests that the anastigmatic three-mirror telescope disclosed therein provides two image light beams from the secondary mirror along two directions to focus them on the image plane respectively. In addition, the Examiner has not pointed to any specific teaching in either Frosch or the German Publication that would suggest or motivate one of ordinary skill in the art to further modify Frosch by replacing the single mirror 20 and single mirror 40 with the two sets of mirrors discussed by the German Publication as suggested by the Examiner.

Amendment

The Examiner has rejected dependent Claim 7 over both Frosch alone and Frosch in view of the German Publication. In both rejections, the Examiner's comments are verbatim and as follows:

“Frosch et al teaches the optical observation could be a telescope but it does not teach that it is a stereoscopic observation system comprising a satellite. However, since the claim also fails to provide the logical and structural relationship among the elements claimed such features is [sic] therefore broadly examined as one can certainly utilize the telescope with a satellite.”

Contrary to the Examiner's position, Frosch or the German Patent, either alone or in combination, teach or suggest a stereoscopic observation system as recited in the claims in combination with a satellite. The Examiner has not pointed to any specific passage or aspect of Frosch or the German Publication as to where either of these references teach or suggest utilizing the telescope of Frosch in combination with a satellite. As such, Applicant submits that the subject matter of Claims 3 and 7 are distinguished over the prior art references of Frosch or Frosch in view of German Patent Publication DE 43 07 831 A1. Accordingly, the rejection under 35 U.S.C. § 103(a) over Frosch in view of the German Publication should be withdrawn.

CONCLUSION

Applicant respectfully submits that Claims 8-14 are in condition for allowance and a notice to that effect is earnestly solicited.

AUTHORIZATION

The Commissioner is hereby authorized to charge any fees which may be required for filing this response to restriction requirement to Deposit Account No. 13-4503, Order No. 3401-4025.

Respectfully submitted,

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